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Strategy in a Masculine Quiz Game

W. Edgar Vinacke and Susan Stanley

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ABSTRACT

Strategy in a Masculine Quiz Game

W. Edgar Vinacke and Susan Stanley

University of Hawaii

An experiment was conducted to determine the effect upon strategy of employing quiz material with masculine interest. This was intended to parallel a previous experiment, in which a quiz game with feminine content was found to increase the occurrence of accommodative strategy, in comparison with a competitive board game. The present experiment replicates the conditions of the feminine quiz game: four patterns of power-relations, with quiz items distributed among the members of the group accordingly; players bargaining to match questions and answers with coalitions permitted; maintenance of a cumulative score. Fifteen triads of each sex played a series of 12 games, three of each power-pattern. Results were shown in comparison with the board game and the feminine quiz game. A number of significant differences occurred between the sexes in the masculine quiz game, and among the three games for one sex or the other, or both. The overall difference in accommodative strategy between the sexes in the masculine quiz game was the same as in previous experiments, but did not reach the 5% level of significance. A more detailed analysis suggests that altering the character or content of the game does not affect the basic features of strategy; rather, such variations introduce particular sorts of problems which are reflected in the style of play.

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INTRODUCTION

Differences in the strategy of males and females while playing a competitive game have been noted in a series of experiments using triads whose members were asked to move around a parcheesi board in order to reach "home" first (Vinacke, 1959; Bond and Vinacke, 1961, Vinacke, 1962). Vinacke and Arkoff (1957) first used this game to investigate what coalitions would occur in triads when players differ in initial power. The basis for their hypotheses was a theoretical analysis developed by Caplow (1956). In his view, alliances will conform to perceptions of strength, with weaker players allying against a stronger one, when this enables them to win. By contrast, the rationale of mathematical game theory suggests that power weightings should be irrelevant to alliances since each player in this situation had to enter an alliance in order to be able to win.* Results of the Vinacke and Arkoff experiment showed that the Caplow strategy occurred significantly more often; i.e., groups of males formed coalitions consistent with their initial perceptions of their individual strength. When female groups were investigated in this experimental design, it was found that they played the game according to a strategy different from that characteristic of the male groups (Vinacke, 1959). The female triads more often failed to arrive at coalitions, more often arrived at triple alliances, more

*For a fuller explanation, see Vinacke, 1962.

often allied when one player could win without any coalition, more often agreed on 50/50 deals, and were in other ways different from male groups.

When mixed-sex triads were added to the series of experiments (Bond' and Vinacke, 1961), the difference in strategies was more sharply revealed, since the two styles were opposed within the same triads. The male strategy was called "exploitative", since the emphasis seemed to be on competition, with the aim of winning, and therefore, to defeat the other players. Because female strategy appeared to be oriented toward the ends of cooperative social interaction and mutual satisfaction of the participants in the game rather than toward winning, this strategy was called "accommodative". The use of six indexes of feminine style has made it possible to find statistically significant differences between masculine and feminine patterns of play (Vinacke, 1962).

The game used in the experiments discussed above appears to contain an inherent bias toward masculine interest and experience, because the board game is strongly competitive, with several features that are probably more familiar to boys than to girls. In an effort to approach closer to feminine interest and experience, and thus to emphasize the characteristics of the accommodative style of play, Uesugi and Vinacke (1963) designed a new game. It was based on facts of special appeal to females. In order to keep the situation as nearly comparable as possible to the masculine game, the central features of the game--the bargaining situation and the stated objective of winning points--were kept the same.

Uesugi and Vinacke found that accommodative strategy significantly increased in the female groups, but not in the male groups. The male triads, however, displayed an increased incidence in some signs of accommodative strategy. These results cannot be interpreted with certainty, because we do not know whether the increase in accommodative strategy is a function of the appeal of this game to women or of the properties of the quiz game itself in comparison to the board game.

Accordingly, a parallel experiment with a "masculine" quiz game was conducted to see whether there would be a shift towards exploitative strategy. This report presents the results of this investigation.

PROCEDURE

The design of this experiment was the same as in the study by Uesugi and Vinacke (1963), except for the use of different quiz questions which were oriented towards areas of masculine rather than feminine interest.

A set of 126 questions and answers was selected from the general topics of the armed forces and wars, economics and business, science, mechanical and engineering achievements, history, government, mathematics, sports, and the achievements of famous men. The following are examples:

Question Card: How many rounds were fought in the longest boxing match in history?

- A. 15 rounds
- B. 30 rounds
- C. 60 rounds
- D. 90 rounds

Answer Card: In 1889, Del Hawkins and Freddie Bogan fought 75 rounds on one day. When the match was called on account of darkness, they continued the next day. Bogan was knocked out in the 15th round of the continued fight. Thus the longest fight took 90 ROUNDS.

Question Card: What is the name of the bird that spends almost its entire life in or on the water and is never seen on land?

Answer Card: THE GREBE is the bird that spends almost its entire life in or on the water.

Question Card: What is the oldest protective agency of the U.S. Government?

Answer Card: THE UNITED STATES SECRET SERVICE of the Treasury Department is the oldest protective agency of the Government. It was established in 1860 to detect counterfeiting, but its duties have been revised since that time.

Question Card: The radio amplifier was invented by:

1. Marconi
2. Armstrong
3. DeForest
4. Alexanderson

Answer Card: DeForest invented the radio amplifier in 1907.

Question Card: A kuk is:

1. An adjective one might apply to a person.
2. A part of an engine.
3. A unit of measure.

Answer Card: A kuk is a UNIT IN THE METRIC SYSTEM OF MEASUREMENT, used in expressing air density in terms of mass.

Question Card: Mount Terror, an 11,400 foot volcano, was scaled for the first time by three New Zealanders, Bruce Alexander, Michael White, and Jim Wilson in 1959. Where is Mount Terror?

Answer Card: Mount Terror is located in the McMURDO SOUND AREA OF ANTARCTICA.

To facilitate matching, questions were typed on 3" by 5" cards of one color while answers were typed on similar cards of another color.

Question cards and answer cards were sorted and placed in envelopes in accord with the desired outcome. These packets were given to the players as determined by the weights on the counters they drew. Some questions and answers were matched within the packet the player received (again the number was determined by the weight drawn) and other matches could be made by coalition.

We employed the same four Caplow (1956) power patterns as those used in the study by Uesugi and Vinacke (1963). The patterns were, as follows: 1) all players of equal strength (each having one matched question and answer and one question and one answer matching cards held by each of the other players for a total of six cards apiece), 2) one member all powerful (one player able to match four questions with four answers among his twelve cards; another player, with six cards, with one matched pair and a question and an answer matching each of the other player's holdings; and one player who could match his four cards only if he allied with someone else), 3) all players of different strength but any two in coalition stronger than the third player (the players held ten, eight, and six cards with three, two, and one matched pairs respectively; and each had a question and an answer which could be matched with one held by each of the other players). The distribution of these patterns is summarized in Table 1.

Fifteen groups of subjects of each sex (90 in all) were recruited from the University of Hawaii student body. The age range of the subjects was from approximately 17 to 50 years of age with the majority between 18 and 24 years. Six female subjects and 31 male subjects received pay for their participation.

**Table 1. Weights and Distribution of Questions and
Answers in the Quiz Game.***

Players and Weights	<u>A¹ (3)</u>	<u>B¹ (3)</u>	<u>C¹ (3) -</u>
Questions	1 - 2 - 3	4 - 5 - 6	7 - 8 - 9
Answers	1-----5-8	4-----2-9	7-----3-6

Power-Pattern: All Powerful

Players and Weights	<u>A⁴ (6)</u>	<u>B¹ (3)</u>	<u>C⁰ (2)</u>
Questions	10-11-12-13-14-15	16-17-18	19-20
Answers	10-11-12-13----17-19	16-----14-20	-----15-18

Power-Pattern: One Stronger

Players and Weights	<u>A² (4)</u>	<u>B¹ (3)</u>	<u>C¹ (3)</u>
Questions	21-22-23-24	25-26-27	28-29-30
Answers	21-22-----26-29	25-----23-30	28-----24-27

Power-Pattern: All Different

Players and Weights	<u>A³ (5)</u>	<u>B² (4)</u>	<u>C¹ (3)</u>
Questions	31-34-33-34-35	36-37-38-39	40-41-42
Answers	31-32-33-----38-41	36-37-----34-42	40-----35-39

*After "Players and Weights", the number following the player's letter indicates his strength without matching; the number in parentheses indicates the total number of questions he received.

Each player read the following instructions before play began:

This game is a quiz contest among three players. Before the game begins, each player will draw a counter out of the hopper. This counter indicates the resources that the player is to have during the game, and quiz questions and answers to the questions will be supplied accordingly. In other words, a player drawing the counter inscribed "3" would be supplied a total of six cards. Questions will be typed on three of these cards and on the other three cards will be typed answers to questions. These answers may or may not match the questions on the other three cards.

The object of the game is to match as many questions with the correct answers as possible. To do this, the player must have in his possession not only the card with the answer but also the card on which the question is typed.

At any time during the game, any player, in return for a promise of a specified portion of the prize, may bargain with any other player or players to form an alliance. In this case, the allies pool the questions and answers in their possession and proceed to match as many of them as possible. Only players in an alliance may see each other's questions and answers.

The game is won by the player who is able to match the greatest number of questions and answers. This player will be awarded 10 points except in the case of ties or when alliances have been made. In the case of ties, the winning players will divide the prize equally among themselves. When alliances have been formed, the prize will be divided according to the conditions agreed upon by members of the alliance. The prize will be recorded on the graph provided. Any player may concede defeat when his position seems hopeless.

The draw of the counters was thus left to chance once the experimenter had selected the appropriate counters for that game. The envelopes containing the cards had the same numbers of their faces as the counters drawn. Players had to show the experimenter their counters in order to obtain their cards. The envelopes were handed, face down, to the players who could then decide whether or not they wished to reveal their weights to one another.

Each triad played three series of the four games, one of each power pattern. The order of game types was randomized within each series according to a modified Latin Square design. After each game, the cumulative score was recorded on the graph by the experimenter in accordance with the alliances formed. The one case in which more than ten points were awarded in a single game was in the event of a triple alliance in which points were shared equally; awarding each player five points in such a game facilitated scoring. The "graph" consisted of a scoreboard, with a separate name tag for the players, a 120-point scale, and a pointer to indicate the score of each player. This cumulative score device was intended to be more appealing to males than the arrow employed for the feminine quiz game.

Beyond any necessary amplification of the instructions, arrangement of the counters, rotation of the order of drawing counters, and distribution of the cards, the experimenter remained an impartial recorder and scorer throughout the games. The players were free to play as they wished as long as the basic conventions were observed.

RESULTS

Although there are many aspects of the data which could be analyzed, we shall devote our attention mainly to those points directly pertinent to the question of whether strategy in the masculine quiz game differs from that in the feminine quiz game studied by Uesugi and Vinacke (1962), supplemented by comparison of both quiz games with the board game employed in other experiments.

All of the studies in this series have regularly shown that the incidence of triple alliances is an especially striking feature of accommodative strategy. In the feminine quiz game, it was found that both male and female groups arrive at this outcome in a very high proportion of the games, but, further, that this result is greater in the female groups. Table 2 gives this result, together with that for the masculine quiz game. It is evident that in the latter situation there continues to be a difference between the sexes ($P < .05$). A comparison of the two games shows that triple alliances are less frequent in the masculine quiz game, highly significant for the male triads ($P < .001$), but non-significant for the female triads ($P < .20$). To this extent, at least, the difference in content between the quiz items is an important factor in style of play. It would appear that the masculine content tends to restore the basically exploitative character of the game, rendering it more similar to that typical of the competitive board game used in previous experiments (see Vinacke, 1962.)

In the board game, female triads tended to avoid coalitions, in comparison with the male groups. In Table 3, the incidence of "no coalition" is shown for the two quiz games. It is evident that there are very few games in which this outcome occurred in either sex. The females are especially to be remarked, in this respect, since the male groups display a higher incidence of "no coalition" in the masculine quiz game, whereas there is no difference for the female groups. That this phenomenon is an unusual difference for the females, is revealed by the following percentages,

Table 2. Triple Alliances in Types When
Any Two Can Win (333, 433, 543).

No. of Triple Alliances		Masculine		Feminine	
		Quiz Game		Quiz Game	
		Male	Female	Male	Female
2 or more		1	7	6	11
1		1	1	5	4
0		<u>13</u>	<u>7</u>	<u>4</u>	<u>0</u>
		15	15	15	15
Intra-Game	χ^2	5.40		3.36	
	P	< .05		> .05	
Inter-Game	χ^2	Male 11.00		Female 2.22	
	P	< .001		< .20	

Table 3. Incidence of No Coalition Outcome
in Types When Any Two Can Win (333, 433, 543).

No. of <u>No Coalition</u>	Masculine Quiz Game		Feminine Quiz Game	
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
1 or more	5*	2	0	2
0	<u>10</u>	<u>13</u>	<u>14</u>	<u>13</u>
	15	15	14**	15

*Vs Male, Feminine Quiz Game, $P = .03$ (Fisher Exact Test.)

**One group established a permanent alliance on the first game.

including the board game, under two incentive conditions:*

 *In making comparisons with the board game, we shall cite only the non-monetary-reward conditions; the Cumulative Score incentive is most directly comparable to the quiz games.

Incidence of One or More "No Coalition" Outcomes in the
 Quiz and Board Games (in percentages).

	Quiz Games		Board Games*	
	<u>Masculine</u>	<u>Feminine</u>	<u>Game-by-Game Play</u>	<u>Cumulative Score</u>
Male Triads	33	0	23	23
Female Triads	13	13	60	40

*N = 30 for each sex.

 Note that in the feminine quiz game, the percentages are 0% and 13% for the male and female triads, respectively, and 33% and 13% in the masculine quiz game. When these figures are compared with the board game, it can be seen that it is primarily the females who differ in the two kinds of game. I would appear, then, that there is no inclination in the quiz games for the females to avoid coalitions, but, on the contrary, by this indication, at least, they seek to arrive at them

Another difference between the two quiz games is shown in Table 4, which gives the incidence of coalitions in the "all-powerful" pattern of strength.

Table 4. Alliances in the All-Powerful
Type (632).

No. of Alliances	Masculine Quiz Game		Feminine Quiz Game	
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
3	14	14	1	2
2	1	1	4	3
1	0	0	3	3
0	<u>0</u>	<u>0</u>	<u>6</u>	<u>7</u>
	15	15	14*	15

Intra-Game Neither comparison is significant.

Inter-Game	χ^2	Male	21.54	Female	19.28
	P		.001		< .001

In this situation, it will be recalled, one person can win without forming an alliance with either of the other players. In experiments with the board game, previously reported, it is typical for no coalitions to occur, in keeping with expectation. In the feminine quiz game, too, comparatively few alliances are reached, nearly half of the groups of each sex forming none at all. A very different result marks the masculine quiz game, where both sexes formed coalitions in nearly every game.

This unusual difference between the two quiz games might have occurred for two different reasons. In the first place, of course, the masculine content itself might be responsible. That is, if the items were of especially great interest, then players might simply be so eager to acquire information that they would share their questions and answers, regardless of their weights. It is rather difficult, however, to see why such a factor should have operated in this situation, but not in the feminine quiz game (at least, without some indication of a sex difference.) An alternative explanation might be sought in procedural or experimenter variations, despite the fact that every effort was made to render the two quiz games similar, save for the changes in content. It is, nevertheless, possible that for some unknown reason it was harder for the players in the masculine quiz game to assess the relative weights in the all-powerful condition, prior to actual matching of questions and answers. At present, no ready choice can be made between these two alternative explanations.

Earlier experiments have suggested that accommodative strategy is more likely than exploitative strategy to result in deals in which the prize is divided equally. The case for the two quiz games is shown in Table 5.

Table 5. Incidence of 50/50 Deals in Types
When Any Two Can Win (333, 433, 543).

% of Two-Person <u>Alliances</u>	Masculine Quiz Game		Feminine Quiz Game	
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
100	3	7	7	11
88-99	4	0	0	0
87 or less	<u>8</u>	<u>7</u>	<u>7</u>	<u>2</u>
	15	14*	14*	13*

Intra-Game: Neither difference is significant,

Inter-Game: No difference is significant, except for Male,

Masculine Game, vs. Female, Feminine Game, $X^2 = 11.62$.

$p < .001$.

*Difference from 15 shows number of groups in which no two-person alliances occurred.

Although there is a tendency for 50/50 deals to be more typical of the feminine quiz game, this difference is not significant for either sex. Similarly, the tendency for more 50/50 deals to be reached by female groups, which appears in both quiz games, is not significant.

In order to facilitate comparisons with the board game, the percentage of groups in which 100% of the two-person deals established in Types I (111), II (322), and V (432) were equal (50/50), is presented in the following table:

Percentage of Triads Reaching 50/50 Deals in 100% of the Two-
Person Alliances Reached in Types When Any Two Can Win.

Quiz Games		Board Game	
	Masculine	Feminine	Cumulative Score
	<u> </u>	<u> </u>	<u> </u>
Male	20	50	10
Female	50	85	53

It is clear that the feminine quiz game, among the game-situations is most likely to bring about 50/50 deals. The masculine game, thus, resembles the competitive board game, in this characteristic.

In previous experiments, there has been some indication that female groups tend to bargain less actively than do male groups, although this attained statistical significance only under the Game-by-Game incentive condition. As shown in Table 6, the feminine quiz game brought about similar differences, especially in those power-patterns in which there are differences in strength but any two players can defeat the third by coalition (Types II (433) and IV (543) in the present study).

Table 6. Amount of Bargaining in Types
When Any Two Can Win (333, 433, 543).

	All Equal (333)						One Stronger (432)						All Different (543)					
Number of Offers	Masc Quiz			Fem Quiz			Masc Quiz			Fem Quiz			Masc Quiz			Fem Quiz		
	M	F		M	F		M	F		M	F		M	F		M	F	
High*	(7)	9	4	(5)	3	6	(6)	6	3	(6)	9	4	(7)	6	3	(6)	10	4
Low	(6)	<u>6</u>	<u>11</u>	(4)	<u>5</u>	<u>9</u>	(5)	<u>9</u>	<u>7</u>	(5)	<u>4</u>	<u>11</u>	(6)	<u>9</u>	<u>7</u>	(5)	<u>3</u>	<u>11</u>
	15	15		15	15		15	15		13	15		15	15		13	15	
Intra-Game X ²	n.s.			n.s.			n.s.			4.90			n.s.			7.02		
P										< .05						< .01		
Inter-Game	Male																	
X ²	n.s.									n.s.						3.34		
P																.05		
	Total																	
	Masculine Game																	
	<u>M</u>			<u>F</u>									<u>M</u>			<u>F</u>		
High*	(13)	3		7			(16)	9		5			9			5		
Low	(17)	<u>7</u>		<u>9</u>				<u>4</u>		<u>10</u>			<u>4</u>			<u>10</u>		
	15			15									13			15		
Intra-Game X ²				n.s.						3.53								
P										> .05								

Table 6.

Inter-Game:** Non-significant for each sex.

***Figures in parentheses to the left of each pair of entries shows the number of offers employed to classify groups for median tests.**

****Medians adjusted for inter-game comparisons.**

There are no significant differences for the masculine quiz game. In this respect, therefore, behavior in the feminine quiz game is similar to that typical of the game-by-game condition, but the masculine quiz game more nearly resembles the cumulative score condition.

Median Number of Offers in the Board and Quiz Games

<u>Board</u>		<u>Game</u>		<u>Quiz</u>		<u>Games</u>	
Game-by-Game		Cum. Score		Masculine		Feminine	
<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
All-Equal	5.50 3.96	3.97	3.50	8.20	5.33	6.33	4.86
322+432, or 433+543	10.83 7.7	10.83	10.75	11.50	11.50	17.00	9.50
Total	16.50 10.92	15.50	14.50	18.50	15.50	24.50	13.00

In both quiz games, the Cumulative Score incentive condition was adopted, because it appears to be an especially favorable one for the female triads (Vinacke, 1959.) It has, however, been found that the establishment of coalitions is affected by relative standing in acquired points (Vinacke, 1962). Table 7 presents the pertinent data for the two quiz games. A word of explanation may be needed to clarify the entries in the table. In each game, there are, of course, three possible two-person alliances. After the first game, it is usually the case that one player has a higher score than either of the other two.

Table 7. Effects of Cumulative Score on
Tendency to Ally.*

All-Equal (333)								
	Masc Quiz				Fem Quiz			
	Male		Female		Male		Female	
	B	(e)	B	(e)	B	(e)	B	(e)
	<hr/>		<hr/>		<hr/>		<hr/>	
Above Chance**	7	(5)	7	(4)	8	(4)	4	(2.6)
Chance or Below	<u>8</u>	<u>(10)</u>	<u>5</u>	<u>(3)</u>	<u>4</u>	<u>(8)</u>	<u>4</u>	<u>(5.4)</u>
	15	(15)	12	(12)	12	(12)	8	(8.0)
χ^2	n.s.		3.38		4.35		n.s.	
P			> .05		< .05			

One Stronger + All Different (433+543)

	Weak Players								Strong Players							
	Masc Quiz				Fem Quiz				Masc Quiz				Fem Quiz			
	Male		Female		Male		Female		Male		Female		Male		Female	
	B	NB	B	NB	B	NB	B	NB	B	NB	B	NB	B	NB	B	NB
	<hr/>		<hr/>		<hr/>		<hr/>		<hr/>		<hr/>		<hr/>		<hr/>	
Above Chance**	10	9	7	5	8	4	7	6	8	2	7	1	8	3	5	2
Chance or Below	<u>2</u>	<u>6</u>	<u>2</u>	<u>7</u>	<u>3</u>	<u>11</u>	<u>2</u>	<u>6</u>	<u>7</u>	<u>13</u>	<u>5</u>	<u>11</u>	<u>7</u>	<u>12</u>	<u>7</u>	<u>11</u>
	12	15	9	12	11	15	9	12	15	15	12	12	15	15	12	13
χ^2	n.s.		n.s.		5.41		n.s.		5.40		4.75		3.60		n.s.	
P			< .05						< .05		< .05		< .05			

Total Alliances (433+543)

	Weak vs Strong								Behind vs Not Behind							
	Masc Quiz				Fem Quiz				Masc Quiz				Fem Quiz			
	Male		Female		Male		Female		Male		Female		Male		Female	
	<u>W</u>	<u>S</u>	<u>W</u>	<u>S</u>	<u>W</u>	<u>S</u>	<u>W</u>	<u>S</u>	<u>B</u>	<u>NB</u>	<u>B</u>	<u>NB</u>	<u>B</u>	<u>NB</u>	<u>B</u>	<u>NB</u>
Above Chance**	10	3	6	4	7	6	9	3	8	5	9	2	8	3	7	5
	<u>5</u>	<u>12</u>	<u>6</u>	<u>8</u>	<u>8</u>	<u>9</u>	<u>4</u>	<u>10</u>	<u>7</u>	<u>10</u>	<u>3</u>	<u>10</u>	<u>7</u>	<u>12</u>	<u>6</u>	<u>8</u>
	15	15	12	12	15	15	13	13	15	15	12	12	15	15	13	13
χ^2	6.64		n.s.		n.s.		5.58		n.s.		8.22		3.80		n.s.	
P	< .01				< .02				< .01		> .05					

*All triple alliances are omitted in this analysis. "B" signifies allies behind in score; "NB" signifies one ally not behind; "e" signifies number expected by chance; "W" signifies weak-player alliance; "S" signifies alliances with the strong players. Difference from 15 shows number of groups in which this situation did not occur.

**For "B", chance = 33% of occurrence; for "NB", chance = 67% of occurrence.

***Corrected for continuity where necessary.

Excluding all other cases (i.e., when two players are tied for the lead, or when all three are tied), we can ascertain those instances when the two players who are behind ally against the third player, who is ahead. Such instances have a one-third chance of occurring. The problem of analysis is different for the all-equal patterns, in comparison with those in which there are internal variations in strength, because weaker players are more likely to be favored in establishing coalitions, and therefore we must differentiate between "weak" and "strong" pairs. The figures are based on two-person alliances.

In the all-equal pattern, we can assess the incidence of the pairs who are behind against the expectation that one-third of these would occur by chance. In Table 7, it can be seen that the masculine quiz game, this coalition exceeds chance, but non-significantly for the males and not quite attaining the 5% level for the females. But, in the feminine quiz game, the situation is reversed, for the male groups arrive at this alliance to a significant degree, but the female groups do not. The difference between the two games is not significant for either sex.

Results for the two types in which there are differences in relative strength, but any two can win, are pooled. The data are cast in a form which permits a direct comparison of alliances between players who are "behind" with those involving the player who is "ahead" ("not behind"). In the case of the two weak players, there is no significant

effect of cumulative score. That is, the weak players tend to ally regardless of score. In the case of the strong member, however, there is clearly a significantly greater tendency to include him as a partner when he is behind than when he is ahead. The difference between the sexes is shown by the general breakdown into weak vs strong and behind vs not behind. For the male triads, alliances between the weak players are significantly more frequent than those including the strong player, whereas the difference between pairs who are behind is not significantly different from those who are not behind. Just the reverse is true for the females. This result differs from the board game, in which, in both sexes, cumulative score has a significant effect.

The feminine quiz game, also, presents a different picture. In this situation, cumulative score has a significant effect for the male groups, both for weak and for strong alliances, but a non-significant effect for the female groups. When coalitions are pooled, the tendency for females to establish weak alliances is significant, but there is no apparent effect of cumulative score. For the male groups, the cumulative score effect approaches significance, but the difference between weak and strong alliances is not significant. In general, therefore, the feminine quiz game resembles the board game more than does the masculine quiz game. None of the inter-game comparisons, however, reaches statistical significance.

Finally, we come to the question of the general strategy followed in the two quiz games. To express the character of strategy, we have employed a general index based on several clearly defined differences between the two sexes, as revealed under all four incentive conditions in the board game. Each triad is scored for the occurrence in each series of games (i.e., a run through the set of power-patterns) of the following "signs" of accommodative strategy:

1. Triple alliances - one or more.
2. No coalition - two or more.
3. 50/50 deals - 100% occurrence of pair-alliances in types with internal differences in strength, but any two can win.
4. Altruistic offers - one or more instances (an "altruistic offer" is one in which one player suggests that the other two ally to his or her disadvantage.)
5. Bargaining - fewer than four offers to ally in types with internal differences in strength, but any two can win.
6. Coalitions in all-powerful types - two or more.

In the quiz games, a few modifications are necessary, because only four patterns of power-relationships were used. Thus, in the sixth sign above, instead of two alliances in the all-powerful patterns, only one alliance was counted. The other signs probably would be affected slightly, but not enough to distort the comparison we propose to make.

In previous research, the application of this general index yields a very striking difference between the two sexes (Vinacke, 1962), under four incentive conditions. Uesugi and Vinacke, (1962) found that accommodative strategy significantly increased for female triads in the feminine quiz game, but that male groups do not significantly differ from the board game. Table 8 presents the data for both quiz game, and comparisons with the board game.

Table 3. Incidence of Accommodative Strategy.

<u>Score on Index</u>	Masculine Quiz Game				Feminine Quiz Game	
	<u>Male</u>	<u>Female</u>			<u>Male</u>	<u>Female</u>
	Corr*	Corr*				
10 or more	1	2	5	6	0	0
8-9	3	3	4	4	4	7
6-7	5	7	2	2	1	6
5 or less	6	3	4	3	8	2
	15	15	15	15	13**	15

Intra-Game	X^2	3.40	Corr	3.33		6.88
	P	> .05		> .05		< .01
Inter-Game	X^2	Male 1.44	Corr	5.04	Female .54	Corr 1.22
	P	> .20		< .05	< .50	< .30
	X^2	Male, Masc vs Female, Fem 1.30 Corr .56				
	X^2	Female, Masc vs Male, Fem 2.41 Corr 3.58				
				< .20		> .05

Note: Based only on TA and 100% 50/50 deals, in Masc Quiz Game,
Male vs Female, $X^2 = 8.58$, $P < .01$.

*Corrected by omitting "no coalition" and raising bargaining
criterion on Types III and IV (433+543); division for Median
Test at 3 or more.

**Two groups which formed permanent alliance excluded.

It is apparent that the difference between the two sexes in the masculine quiz game is in the same direction, as in the feminine quiz game (and all previous experiments.) However, it is much reduced and fails to attain the 5% level of significance. The effect of modifying the criteria of accommodative strategy by omitting the occurrence of "no coalition" and increasing the number of offers on Types II and IV is negligible. However, when the index is based solely on the incidence of triple alliances and 100% 50/50 deals, there is a highly significant difference in the expected direction ($\chi^2 = 8.58$, $P < .01$). Thus, there are certain striking features of the masculine quiz game, as revealed in preceding tables, which tend to change the character of strategy. These variations will be considered in the next section.

Despite the fact that there are clear differences between the two quiz games, the inter-game comparison is not significant for either sex (except for males, using the corrected index). However, the difference between the female groups in the masculine quiz game and the male groups in the feminine game approaches significance, using the corrected index ($P = .05$), suggesting that the difference between the two games is greater for male than for female triads.

Scrutiny of the comparisons between board and quiz games shows that, for males, there is significantly more accommodative behavior in the masculine quiz game, whereas, for females, the feminine quiz game evokes more accommodative strategy (the Cumulative Score condition, rather than the Game-by-Game condition, is the appropriate one.) Thus, as we have seen in specific ways above, the variation in content appears to have different effects for the two sexes. The following median scores summarize the differences.

Comparative Scores on Index to Accommodative Strategy (Medians)*

Quiz Games		Board Games	
<u>Masculine</u>	<u>Feminine</u>	<u>Game-by-Game</u>	<u>Cumulative Score</u>
Male 7 (4)	4 (2)	3 (2)	3 (3)
Female 8 (6)	7 (7)	7 (6)	5.5 (5)

*When the sign based on alliances in the all-powerful type is omitted the medians became those shown in parentheses.

The chief factor that makes the male triads appear to be so much more accommodative in the masculine quiz game may be the unusually large number of alliances in the all-powerful pattern. By omitting this index, the medians change as shown in parentheses. It is evident that the masculine game thus resembles much more nearly the other conditions. Further research will be necessary to check on this point. In particular, we shall expose the same groups to both quiz games, employing the same experimenter.

Discussion

Central to this investigation is the question of what changes in the character of strategy are brought about by varying the content of a game. In the competitive board game, used in previous experiments (Vinacke, 1959, 1962), a number of differences between male and female triads led to the concepts of exploitative strategy (typical of male players) and accommodative strategy (typical of female players). After this distinction was clearly formulated, there naturally followed the question of the degree to which these strategies depend for their

manifestations upon the characteristics of the game itself, since the board game appears to have a "built in" masculine bias. As a consequence, Uesugi and Vinacke (1962) devised a quiz game, designed to maximize feminine interest, but still retaining essential features of the board game. They found that there were changes in the direction of accommodative strategy in both sexes, but that the general effect was significant only for the females. Thus, the conclusion seemed to be warranted that accommodative strategy emerges especially strongly in a "feminine" situation, just as the exploitative strategy is dominantly typical of the "masculine" situation.

A couple of important issues, however, remained obscure. In the first place, it might be argued that the quiz game introduces conditions too different from those that obtain in the board game to permit a really adequate direct comparison. In the second place, one could really not ascertain to what extent the feminine character of the items (rather than the quiz game itself) is the important element. It was to gain increased light on these points that the present experiment was conducted. What we need to do, then, is to examine to what extent strategy changes as a result of two conditions which may be viewed as "feminine" in character; namely, the quiz game itself and the content of the questions and answers.

Let us briefly draw together the results, as they have been presented in the preceding tables, endeavoring in each case to relate them to the points just mentioned.

MALE TRIADS

	Board	Masculine	Feminine
	<u>Game (A)</u>	<u>Quiz (B)</u>	<u>Quiz (C)</u>
Triple Alliances	Few	Few	More than in A or B
No Coalition	Few	Few	None
All-Powerful Type: Coalitions	Few	Very Many	Few
50/50 Deals	Few	Few	Many
Bargaining	Much	Much	More than in A or B
<u>Effect of Cumulative Score:</u>			
All-Equal	Very Great	Little	Greater than in B
Weak Alliances	Very Little	Very Little	Great
Strong Alliances	Little	Great	Less than in B
All Alliances	Great	Very Little	Great
Overall Strategy	Exploitative	More Accommodative than in A	Less Accommodative than in B

FEMALE TRIADS

	Board	Masculine	Feminine
	<u>Game (A)</u>	<u>Quiz (B)</u>	<u>Quiz (C)</u>
Triple Alliances	Many	Many	More than in A or B
No Coalition	Many	Few	Few
All-Powerful Type: Coalitions	More than in Male	Very Many	Few
50/50 Deals	More than in Male	Many	More than in B
Bargaining	Less than in Male	Much	Less than in Male
<u>Effect of Cumulative Score:</u>			
All-Equal	Very Great	Greater than in C	Little
Weak Alliances	Little	Very Little	Very Little
Strong Alliances	Little	Great	Little
All Alliances	Great	Great	Very Little
Overall Strategy	Accommodative	More Accommodative than in A	More Accommodative than in A

From these results, it can be seen that, in general, (if we ignore the all-powerful type) the feminine quiz game presents the sharpest picture of accommodative strategy. Although the masculine quiz game in some ways resembles the board game, and in others is like the feminine quiz game, it is generally more like the board game. Thus, there is little doubt that changing the content of the quiz items affects the characteristics of strategy just as does, also, changing the game itself. If, as we have previously suggested (Uesugi and Vinacke, 1962), the feminine quiz game markedly enhances the occurrence of accommodative strategy, then we must try to interpret the effects of the masculine quiz items.

Consider first, that we really have two aspects of the situation to take into account. On the one hand, we must compare the two types of games, board and quiz; on the other hand, we must look at the two kinds of content in the quiz game, masculine and feminine.

With respect to the kind of game, there appear to be a very few ways in which the two quiz games resemble each other more than either resembles the board game. The chief common characteristic of the quiz games is the low incidence of "no coalition" outcomes in both sexes, compared to the board game. (But even here, the male triads do not differ much from the board game.) To this extent, the quiz items, regardless of content, seem to evoke widespread active interest.

In other respects the two quiz games differ in their effects, with one sex or the other tending to manifest characteristics like those in the board game; and, as we have emphasized, there is a rather

clearcut indication that the feminine quiz game increases accommodative characteristics, whereas the masculine quiz game tends to reduce them. Thus, we could argue that the quiz game shifts strategy in an accommodative direction, but masculine content has an opposite effect, with the result that strategy reverts to a considerable degree to the exploitative pattern. Thus, in terms of our overall index to accommodative strategy, there is less difference between the sexes in the masculine quiz game than either in the board game, or in the feminine quiz game. But, if we merely focus on the specific effects of the masculine quiz game (triple alliances and the establishment of 50/50 deals), the females manifest a higher degree of accommodative strategy.

To some extent, the same point emerges in this study, as was previously evident for variations in incentive. The various conditions of play (here, the content of the quiz items) introduces special considerations into the problem of winning. These affect details whereby strategy is displayed, but evidently does not destroy the general strategy itself.

With regard to the question with which we began, therefore, our interpretation must be that it is not so much an inherent difference between board and quiz games that influences strategy, as it is the content itself. A game designed to maximize feminine appeal (the feminine quiz game) enhances accommodative strategy (in females, especially) whereas a game intended to maximize masculine appeal enhances exploitative strategy (especially in males.)

The point that remains most obscure concerns bargaining and coalitions in the all-powerful pattern. The high incidence displayed in the masculine quiz game cannot be dismissed as an artifact without further research, because as plainly appears in other experiments (cf. variations with incentives, Vinacke, 1962), it might be an effect genuinely typical of the quiz game (whether masculine or feminine). Because either the game-specific or artifactual explanation is equally plausible, we shall need to replicate the experiment in a manner which will permit a direct comparison of the two quiz games for the same triads and experimenter.

Summary and Conclusions

A quiz game, with masculine-interest content was devised to parallel the previously investigated quiz game with feminine-interest content. Fifteen triads of each sex played this game under conditions as nearly as possible like those that obtained for the feminine quiz game. That is, players endeavored to match questions and answers, by bargaining, with the stated objective of winning by acquiring a majority of matched items. Coalitions were permitted. Power-patterns were: all-equal, all-powerful, one stronger but weaker than the other two in combination, and all different but no member stronger than the other two in combination. As in other experiments in this series, players were free to bargain, as they pleased and to arrive at whatever deals they wished. Scores were maintained in cumulative fashion. Results were presented in comparison with the feminine quiz game and the previously employed board game..

The following conclusions emerge:

1. In the masculine quiz game, the following significant differences between the sexes were found: female triads arrived more often at triple alliances; in male triads, players tend to ally when weak, regardless of score, whereas in female triads players who are behind tend to ally regardless of strength.

2. A number of specific differences among the three kinds of game were found for either sex or for both sexes. In general, however, the masculine quiz game yields behavior more similar to the board game, than does the feminine quiz game.

3. The difference between the sexes in accommodative strategy does not attain the 5% level of significance in the masculine quiz game. But employing only triple alliances and 50/50 deals the difference reaches the 1% level. However, the general occurrence of signs of accommodative strategy is quite similar among the three kinds of game.

4. It is suggested that the difference in the content of the quiz games and the difference in the game itself (board versus quiz) does not fundamentally alter the character of the strategy followed by the two sexes. Rather, the specific features of the game introduce particular problem-variations, which are reflected in the style of play.

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